SEQUENCE LISTING

<110> Hahn, Gabriele

<120> Novel Virus Encoded Chemokines Determine the Tissue Tropism of Human Cytomegalovirus (HCMV)

<130> 2923-0545

<140> 10/619,189
<141> 2003-07-15

<160> 79

<170> PatentIn version 3.2

<210> 1
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 1
aaaccacgtc ctcgtcacac gtcgttcgcg gacatagcaa gaaatccacg tcgccacatc 60

tcgagacgat ttattcaaca aagccacg 88

<210> 2
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 2
aacggcgtca ggtctttggg actcatgacg cgcggttttc aaaattccct gcgcgcgcga 60

cgggcgccag tgttacaacc aattaacc 88

<210> 3
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 3
gcgccacacg cccggagcct cgagttcagc gtgcggctct ttgccaacta gcctgcgtca 60

cggcgattta ttcaacaaag c 81

<210> 4
<211> 88
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 4
aacggcgtca ggtctttggg actcatgacg cgcggttttc aaaattccct gcgcgcgcga 60

cgggcgccag tgttacaacc aattaacc 88

<210> 5
<211> 82
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 5
tgcgttctgt ggtgcgtctg gatctgtctc tcgacgtttc tgatagccat gttccatcga 60

cgatttattc aacaaagcca cg 82

<210> 6
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 6
cggcacacat ccagccgttt gtgtttctta acgctctcca ggtactgatc caggcccacg 60

gccagtgtta caaccaatta a 81

<210> 7
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 7
ttgagatttc tgtcgccgac taaattcatg tcgcgcgata gtggtgttta tcgccgatag 60

cgatttattc aacaaagcca c 81

<210> 8
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 8
aatattgatt tacgctatat aaccaatgac taatatggct aatggccaat attgatgcaa 60

gccagtgtta caaccaatta a 81

<210> 9
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 9
gactatgtgc atgttcggct actgagctac cgaggcgacc ccctggtctt caagcacact 60

cgatttattc aacaaagcca c 81

<210> 10
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 10
caccaggtag gttatcaaaa cgcgagccca tatcgccgcc atcattgtaa tcagcaatgt 60

gccagtgtta caaccaatta a 81

<210> 11
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 11

acgtcctcgt cacacgtcgt tcgcggacat agcaagaaat tcacgtcgcc acgtctcgag 60

acgatttatt caacaaagcc a 81

<210> 12
<211> 84
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 12
aaggttcttc catttccgag gcggtcagtt catcgtacac cgagacgtag tacctgatgg 60

ggccagtgtt acaaccaatt aacc 84

<210> 13
<211> 76
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 13
tgtctttcgg ttccaactct ttccccgccc catcacctcg cctgtactat gtgtcgattt 60

attcaacaaa gccacg 76

<210> 14
<211> 87
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 14
tcgcgcgaca tgaatttagt cggcgacaga aatctcgaaa cgcgtatttc ggacaaacac 60

acatgccagt gttacaacca attaacc 87

<210> 15
<211> 90
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 15
cgctgtaggg ataaatagtg cgatggcgtt tgtgggagaa cgcagtagcg atgggttgcg 60

acgtgcaccg atttattcaa caaagccacg 90

<210> 16
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 16
caccaggtag gttatcaaaa cgcgagccca tatcgccgcc atcattgtaa tcagcaatgt 60

gccagtgtta caaccaatta a 81

<210> 17
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 17
cagtctgcaa catgcggctg tgctgggtgt ggctgtctgt ttgtctgtgc gccgtggtgc 60

cgatttattc aacaaagcca c 81

<210> 18
<211> 74
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 18
gctagttggc aaagagccgc acgctgaact cgaggctccg ggcgtgtggc ggccagtgtt 60

acaaccaatt aacc 74

<210> 19
<211> 83
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 19
gattttccgg gaataccgga tattacgaat tactggtagt gacgtagata ataaaattat 60

acgatttatt caacaaagcc acg 83

<210> 20
<211> 76
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 20
caccaaagcc gttagcgtgc ccagagctac cgcacggtaa aatagggaca tgagccagtg 60

ttacaaccaa ttaacc 76

<210> 21
<211> 408
<212> DNA
<213> Human cytomegalovirus

<400> 21
gtctgcaaca tgcggctgtc tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60

ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120

gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 180

gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 240

aagagaatca acgtgaccga ggtgtcgttg ctcatcagcg actttatacg tcagaaccgt 300

cgcggcggca ccaacaaaag gaccacgttc aacgccgccg gttcgctggc gcctcacgcc 360

cggagcctcg agttcagcgt gcggctcttt gccaactagc ctgcgtca 408

<210> 22
<211> 516
<212> DNA
<213> Human cytomegalovirus

<400> 22
gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60

ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120

gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 180

gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 240

aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa 300

cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360

gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 420

aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag 480

ttcagcgtgc ggctctttgc caactagcct gcgtca 516

<210> 23
<211> 410
<212> DNA
<213> Human cytomegalovirus

<400> 23
gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60

ggtcagtgcc agcgggagac cgcagaaaaa aaaacgatta ttaccgagta ccgcattact 120

gggacgcgtg ctctcgcgcg ctgcctgacc aaacccgtta caagtatgtg gaacagctcg 180

tggacctcac gttgaactac cactacgatg cgagccacgg cttggacaac tttgacgtgc 240

tcaagagaat caacgtgacc gaggtgtcgt tgctcatcag cgactttaga cgtcagaacc 300

gtcgcggcgg caccaacaaa aggaccacgt tcaacgccgc cggttcgctg gcgcctcacg 360

cccggagcct cgagttcagc gtgcggctct ttgccaacta gcctgcgtca 410

<210> 24
<211> 516
<212> DNA
<213> Human cytomegalovirus

<400> 24
gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60

ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120

gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 180

gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 240

aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa 300

cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360

gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 420

aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag 480

ttcagcgtgc ggctctttgc caactagcct gcgtca 516

<210> 25
<211> 656
<212> DNA
<213> Human cytomegalovirus

<400> 25
ccgtgcgtca tgagtcccaa aaacctgacg ccgttcttga cggcgttgtg gctgctattg 60

ggtcacagcc gcgtgccgcg ggtacgcgca gaagaatgtt gcgaattcat aaacgtcaac 120

cacccgccgg aacgctgtta cgatttcaaa atgtgcaatc gcttcaccgt cgcgtacgta 180

ttttcatgat tgtctgcgtt ctgtggtgcg tctggatctg tctctcgacg tttctgatag 240

ccatgttcca tcgacgatcc tcgggaatgc cagagtagat tttcatgaat ccacaggctg 300

cggtgtccgg acggcgaagt ctgctacagt cccgagaaaa cggctgagat tcgcgggatc 360

gtcaccacca tgacccattc attgacacgc caggtcgtac acaacaaact gacgaactgc 420

aactacaatc cgttatacct cgaagctgac gggcgaatac gctgcggcaa agtgaacgac 480

aaggcgcagt acctgctggg cgccgctggc agcgttccct atcgatggat caacctggaa 540

tacgacaaga taacccggat cgtgggcctg gatcagtacc tggagagcgt taagaaacac 600

aaacggctgg atgtgtgccg cgctaaaatg ggctatatgc tgcagtgaat aataaa 656

<210> 26
<211> 656
<212> DNA
<213> Human cytomegalovirus

<400> 26
ccgcgcgtca tgagtcccaa aaacctgacg ccgttcttga cggcgttgtg gctgctattg 60

ggtcacagcc gcgtgccgcg ggtacgcgca gaagaatgtt gcgaattcat aaacgtcaac 120

cacccgccgg aacgctgtta cgatttcaaa atgtgcaatc gcttcaccgt cgcgtacgta 180

ttttcatgat tgtctgcgtt ctgtggtgcg tctggatctg tctctcgacg tttctgatag 240

ccatgttcca tcgacgatcc tcgggaatgc cagagtagat tttcatgaat ccacaggctg 300

cggtgtccgg acggcgaagt ctgctacagt cccgagaaaa cggctgagat tcgcgggatc 360

gtcaccacca tgacccattc attgacacgc caggtcgtac acaacaaact gacgagctgc 420

aactacaatc cgttatacct cgaagctgac gggcgaatac gctgcggcaa agtgaacgac 480

aaggcgcagt acctgctggg cgccgctggc ggcgttccct atcgatggat caacctggaa 540

tacgacaaga tagcccggat cgtgggcctg gatcagtacc tggagagcgt taagaaacac 600

aaacggctgg atgtgtgccg cgctaaaatg ggctatatgc tgcagtgaat aataaa 656

<210> 27
<211> 533
<212> DNA
<213> Human cytomegalovirus

<400> 27
ccgcgcgtca tgagtcccaa aaacctgacg ccgttcttga cggcgttgtg gctgctattg 60

ggtcacagcc gcgtgccgcg ggtacgcgca gaagaatgtt gcgaattcat aaacgtcaac 120

cacccgccgg aacgctgtta cgatttcaaa atgtgcaatc gcttcaccgt cgcgctgcgg 180

tgtccggacg gcgaagtctg ctacagtccc gagaaaacgg ctgagattcg cgggatcgtc 240

accaccatga cccattcatt gacacgccag gtcgtacaca acaaactgac gagctgcaac 300

tacaatctgt tatacctcga agctgacggg cgaatacgct gcggcaaagt gaacgacaag 360

gcgcagtacc tgctgggcgc cgctggcagc gttccctatc gatggatcaa cctggaatac 420

gacaagataa cccggatcgt gggcctggat cagtacctgg agagcgttaa gaaatacaaa 480

cggctggatg tgtgccgcgc taaaatgggc tatatgctgc agtgaataat aaa 533

<210> 28
<211> 775
<212> DNA
<213> Human cytomegalovirus

<400> 28
ccgcgcgtca tgagtcccaa aaacctgacg ccgttcttga cggcgttgtg gctgctattg 60

ggtcacagcc gcgtgccgcg ggtacgcgca gaagaatgtt gcgaattcat aaacgtcaac 120

cacccgccgg aacgctgtta cgatttcaaa atgtgcaatc gcttcaccgt cgcgtacgta 180

tttttatgat tgtctgcgtt ctgtggtgcg tctggatttg tctctcgacg tttctgatag 240

ccatgttcca tcgacgatcc tcgggaatgc cagagtagat tttcatgaat ccacaggctg 300

cggtgtccgg acggcgaagt ctgctacagt cccgagaaaa cggctgagat tcgcgggatc 360

gtcaccacca tgacccattc attgacacgc caggtcgtac acaacaaact gacgagctgc 420

aactacaatc cgtaagtctc ttcctcgagg gccttacagc ctatgggaaa gtaagacaga 480

gggacaaaac atcattaaaa aaaaagtcta atttcacgtt ttgtaccccc ccttcccctc 540

cgtgttgtag gttatacctc gaagctgacg ggcgaatacg ctgcggcaaa gtgaacgaca 600

aggcgcagta cctgctgggc gccgctggca gcgttcccta tcgatggatc aacctggaat 660

acgacaagat aacccggatc gtgggcctgg atcagtacct ggagagcgtt aagaaacaca 720

aacggctgga tgtgtgccgc gctaaaatgg gctatatgct gcagtgaata ataaa 775

<210> 29
<211> 60
<212> DNA
<213> Human cytomegalovirus

<400> 29
cgctaaaatg ggctatatgc tgcagtgaat aataaaatgt gtgtttgtcc gcaaaaaaaa 60

<210> 30
<211> 60
<212> DNA
<213> Human cytomegalovirus

<400> 30
cgctaaaatg ggctatatgc tgcagtgaat aataaaatgt gtgtttgtcc aaaaaaaaaa 60

<210> 31
<211> 60
<212> DNA
<213> Human cytomegalovirus

<400> 31
cgctaaaatg ggctatatgc tgcagtgaat aataaaatgt gtgtttgtcc aaaaaaaaaa 60

<210> 32
<211> 52
<212> DNA
<213> Human cytomegalovirus

<400> 32
cgctaaaatg ggctatatgc tgcagtgaat aataaaatgt gtgtttgtcc ga 52

<210> 33
<211> 1977
<212> DNA
<213> Human cytomegalovirus

<400> 33
gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60

ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120

gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 180

gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 240

aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa 300

cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360

gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 420

aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag 480

ttcagcgtgc ggctctttgc caactagcct gcgtcacggg aaataatatg ctacggcttc 540

tgcttcgtca ccactttcac tgcctgcttc tgtgcgcggt ttgggcaacg ccctgtctgg 600

cgtctccgtg gttcacgcta acggcgaacc agaatccgtc cccgccatgg tctaaactga 660

cgtatcccaa accgcatgac gcggcgacgt tttactgtcc ttttctctat ccctcgcccc 720

cacggtcccc ctcgcaattc ccggggttcc agcgggtatc aacgggtccc gagtgtcgca 780

acgagaccct gtatctgctg tacaaccggg aaggccagac cttggtggag agaagctcca 840

cctgggtgaa aaaggtgatc tggtatctga gcggtcgcaa tcagaccatc ctccaacgga 900

tgccccgaac ggcttcgaaa ccgagcgacg gaaacgtgca gatcagcgtg gaagacgcca 960

agatttttgg agcgcacatg gtgcccaagc agaccaagct gctacgtttc gtcgtcaacg 1020

atggcacacg ttatcagatg tgtgtgatga aactggagag ctgggcccac gtcttccggg 1080

actacagcgt gtcttttcag gtgcgattga cgttcaccga ggccaataac cagacttaca 1140

ccttctgcac ccatcccaat ctcatcgttt gagcccgtcg cgcgcgcagg gaattttgaa 1200

aaccgcgcgt catgagtccc aaaaacctga cgccgttctt gacggcgttg tggctgctat 1260

tgggtcacag ccgcgtgccg cgggtacgcg cagaagaatg ttgcgaattc ataaacgtca 1320

accacccgcc ggaacgctgt tacgatttca aaatgtgcaa tcgcttcacc gtcgcgtacg 1380

tattttcatg attgtctgcg ttctgtggtg cgtctggatt tgtctctcga cgtttctgat 1440

agccatgttc catcgacgat cctcgggaat gccagagtag attttcatga atccacaggc 1500

tgcggtgtcc ggacggcgaa gtctgctaca gtcccgagaa aacggctgag attcgcggga 1560

tcgtcaccac catgacccat tcattgacac gccaggtcgt acacaacaaa ctgacgagct 1620

gcaactacaa tccgtaagtc tcttcctcga gggccttaca gcctatggga aagtaagaca 1680

gagggacaaa acatcattaa aaaaaaagtc taatttcacg ttttgtaccc ccccttcccc 1740

tccgtgttgt aggttatacc tcgaagctga cgggcgaata cgctgcggca aagtgaacga 1800

caaggcgcag tacctgctgg gcgccgctgg cagcgttccc tatcgatgga tcaacctgga 1860

atacgacaag ataacccgga tcgtgggcct ggatcagtac ctggagagcg ttaagaaaca 1920

caaacggctg gatgtgtgcc gcgctaaaat gggctatatg ctgcagtgaa taataaa 1977

<210> 34
<211> 129
<212> PRT
<213> Human cytomegalovirus

<400> 34

Met Arg Leu Cys Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val
1 5 10 15

Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg
20 25 30

Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr
35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His
50 55 60

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg Ile
65 70 75 80

Asn Val Thr Glu Val Ser Leu Leu Ile Ser Asp Phe Arg Arg Gln Asn
85 90 95

Arg Arg Gly Gly Thr Asn Lys Arg Thr Thr Phe Asn Ala Ala Gly Ser
100 105 110

Leu Ala Pro His Ala Arg Ser Leu Glu Phe Ser Val Arg Leu Phe Ala
115 120 125

Asn

<210> 35
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 35
cggcacacat ccagccgttt gtgtttctta 30

<210> 36
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 36
taacgctctc caggtactga tccaggccca 30

<210> 37
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 37
tcgtcagttt gttgtgtacg acctggcgtg 30

<210> 38
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucloetide primer

<400> 38
tattggcctc ggtgaacgtc aatcgcacct 30

<210> 39
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 39
tgtgtcgggt gtggctgtct gtttgtctgt 30

<210> 40
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 40
tctgcttcgt caccactttc actgcctgct 30

<210> 41
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 41
cgcagaagaa tgttgcgaat tcataaacgt 30

<210> 42
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonulceotide primer

<400> 42
gctgcggtgt ccggacggcg aagtctgcta 30

<210> 43
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 43
ccagctggca gattcccaaa ctaatgaaag 30

<210> 44
<211> 30
<212> DNA
<213> Artificial Sequence

<220>

<223> oligonucleotide primer

<400> 44
ctttcggttc caactctttc cccgccccat 30

<210> 45
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 45
cacctcgcct atactatgtg tatgatgtct 30

<210> 46
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 46
ctctctttct cagtctgcaa catgcggctg 30

<210> 47
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 47
gttgtccaag ccgtcgctcg catcgtagtg 30

<210> 48
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 48
cataataaag ctctctttct cagtctgcaa 30

<210> 49

<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> oligonucleotide primer

<400> 49
tatgatgtct cataataaag ctctctttct 30

<210> 50
<211> 390
<212> DNA
<213> Human cytomegalovirus

<400> 50
atgcggctgt ctcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60

cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 120

tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg 180

ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagagaatc 240

aacgtgaccg aggtgtcgtt gctcatcagc gactttatac gtcagaaccg tcgcggcggc 300

accaacaaaa ggaccacgtt caacgccgcc ggttcgctgg cgcctcacgc ccggagcctc 360

gagttcagcg tgcggctctt tgccaactag 390

<210> 51
<211> 129
<212> PRT
<213> Human cytomegalovirus

<400> 51

Met Arg Leu Ser Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val
1 5 10 15

Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg
20 25 30

Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr
35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His
50 55 60

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg Ile
65 70 75 80

Asn Val Thr Glu Val Ser Leu Leu Ile Ser Asp Phe Ile Arg Gln Asn
85 90 95

Arg Arg Gly Gly Thr Asn Lys Arg Thr Thr Phe Asn Ala Ala Gly Ser
100 105 110

Leu Ala Pro His Ala Arg Ser Leu Glu Phe Ser Val Arg Leu Phe Ala
115 120 125

Asn

<210> 52
<211> 240
<212> DNA
<213> Human cytomegalovirus

<400> 52
atgcggctgt gtcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60

cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 120

tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg 180

ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagaggtga 240

<210> 53
<211> 79
<212> PRT
<213> Human cytomegalovirus

<400> 53

Met Arg Leu Cys Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val
1 5 10 15

Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg
20 25 30

Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr
35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His

50 55 60

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg
65 70 75

<210> 54
<211> 1977
<212> DNA
<213> Human cytomegalovirus

<400> 54
gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60

ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120

gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 180

gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 240

aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa 300

cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360

gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 420

aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag 480

ttcagcgtgc ggctctttgc caactagcct gcgtcacggg aaataatatg ctacggcttc 540

tgcttcgtca ccactttcac tgcctgcttc tgtgcgcggt ttgggcaacg ccctgtctgg 600

cgtctccgtg gttcacgcta acggcgaacc agaatccgtc cccgccatgg tctaaactga 660

cgtatcccaa accgcatgac gcggcgacgt tttactgtcc ttttctctat ccctcgcccc 720

cacggtcccc ctcgcaattc ccggggttcc agcgggtatc aacgggtccc gagtgtcgca 780

acgagaccct gtatctgctg tacaaccggg aaggccagac cttggtggag agaagctcca 840

cctgggtgaa aaaggtgatc tggtatctga gcggtcgcaa tcagaccatc ctccaacgga 900

tgccccgaac ggcttcgaaa ccgagcgacg gaaacgtgca gatcagcgtg gaagacgcca 960

agatttttgg agcgcacatg gtgcccaagc agaccaagct gctacgtttc gtcgtcaacg 1020

atggcacacg ttatcagatg tgtgtgatga aactggagag ctgggcccac gtcttccggg 1080

actacagcgt gtcttttcag gtgcgattga cgttcaccga ggccaataac cagacttaca 1140

ccttctgcac ccatcccaat ctcatcgttt gagcccgtcg cgcgcgcagg gaattttgaa 1200

aaccgcgcgt catgagtccc aaaaacctga cgccgttctt gacggcgttg tggctgctat 1260

tgggtcacag ccgcgtgccg cgggtacgcg cagaagaatg ttgcgaattc ataaacgtca 1320

accacccgcc ggaacgctgt tacgatttca aaatgtgcaa tcgcttcacc gtcgcgtacg 1380

tattttcatg attgtctgcg ttctgtggtg cgtctggatt tgtctctcga cgtttctgat 1440

agccatgttc catcgacgat cctcgggaat gccagagtag attttcatga atccacaggc 1500

tgcggtgtcc ggacggcgaa gtctgctaca gtcccgagaa aacggctgag attcgcggga 1560

tcgtcaccac catgacccat tcattgacac gccaggtcgt acacaacaaa ctgacgagct 1620

gcaactacaa tccgtaagtc tcttcctcga gggccttaca gcctatggga aagtaagaca 1680

gagggacaaa acatcattaa aaaaaaagtc taatttcacg ttttgtaccc ccccttcccc 1740

tccgtgttgt aggttatacc tcgaagctga cgggcgaata cgctgcggca aagtgaacga 1800

caaggcgcag tacctgctgg gcgccgctgg cagcgttccc tatcgatgga tcaacctgga 1860

atacgacaag ataacccgga tcgtgggcct ggatcagtac ctggagagcg ttaagaaaca 1920

caaacggctg gatgtgtgcc gcgctaaaat gggctatatg ctgcagtgaa taataaa 1977

<210> 55
<211> 1741
<212> DNA
<213> Human cytomegalovirus

<400> 55
atgcggctgt ctcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60

cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 120

tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg 180

ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagagaatc 240

aacgtgaccg aggtgtcgtt gctcatcagc gactttatac gtcagaaccg tcgcggcggc 300

accaacaaaa ggaccacgtt caacgccgcc ggttcgctgg cgcctcacgc ccggagcctc 360

gagttcagcg tgcggctctt tgccaactag cctgcgtcac gggaaataat atgctacggc 420

ttctgcttcg tcaccacttt cactgcctgc ttctgtgcgc ggtttgggca acgccctgtc 480

tggcgtctcc gtggttcacg ctaacggcga accagaatcc gtccccgcca tggtctaaac 540

tgacgtatcc caaaccgcat gacgcggcga cgttttactg tccttttctc tatccctcgc 600

ccccacggtc cccctcgcaa ttcccggggt tccagcgggt atcaacgggt cccgagtgtc 660

gcaacgagac cctgtatctg ctgtacaacc gggaaggcca gaccttggtg gagagaagct 720

ccacctgggt gaaaaaggtg atctggtatc tgagcggtcg caatcagacc atcctccaac 780

ggatgccccg aacggcttcg aaaccgagcg acggaaacgt gcagatcagc gtggaagacg 840

ccaagatttt tggagcgcac atggtgccca agcagaccaa gctgctacgt ttcgtcgcca 900

acgatggcac acgttatcag atgtgtgtga tgaaactgga gagctgggcc cacgtcttcc 960

gggactacag cgtgtctttt caggtgcgat tgacgttcac cgaggccaat aaccagactt 1020

acaccttctg cacccatccc aatctcatcg tttgagcccg tcgcgcgcgc agggaatttt 1080

gaaaaccgtg cgtcatgagt cccaaaaacc tgacgccgtt cttgacggcg ttgtggctgc 1140

tattgggtca cagccgcgtg ccgcgggtac gcgcagaaga atgttgcgaa ttcataaacg 1200

tcaaccaccc gccggaacgc tgttacgatt tcaaaatgtg caatcgcttc accgtcgcgt 1260

acgtattttc atgattgtct gcgttctgtg gtgcgtctgg atctgtctct cgacgtttct 1320

gatagccatg ttccatcgac gatcctcggg aatgccagag tagattttca tgaatccaca 1380

ggctgcggtg tccggacggc gaagtctgct acagtcccga gaaaacggct gagattcgcg 1440

ggatcgtcac caccatgacc cattcattga cacgccaggt cgtacacaac aaactgacga 1500

actgcaacta caatccgtta tacctcgaag ctgacgggcg aatacgctgc ggcaaagtga 1560

acgacaaggc gcagtacctg ctgggcgccg ctggcagcgt tccctatcga tggatcaacc 1620

tggaatacga caagataacc cggatcgtgg gcctggatca gtacctggag agcgttaaga 1680

aacacaaacg gctggatgtg tgccgcgcta aaatgggcta tatgctgcag tgaataataa 1740

a 1741

<210> 56
<211> 390
<212> DNA
<213> Human cytomegalovirus

<400> 56
atgcggctgt ctcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60

cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 120

tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg 180

ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagagaatc 240

aacgtgaccg aggtgtcgtt gctcatcagc gactttatac gtcagaaccg tcgcggcggc 300

accaacaaaa ggaccacgtt caacgccgcc ggttcgctgg cgcctcacgc ccggagcctc 360

gagttcagcg tgcggctctt tgccaactag 390

<210> 57
<211> 129
<212> PRT
<213> Human cytomegalovirus

<400> 57

Met Arg Leu Ser Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val
1 5 10 15

Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg
20 25 30

Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr
35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His
50 55 60

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg Ile
65 70 75 80

Asn Val Thr Glu Val Ser Leu Leu Ile Ser Asp Phe Ile Arg Gln Asn
85 90 95

Arg Arg Gly Gly Thr Asn Lys Arg Thr Thr Phe Asn Ala Ala Gly Ser
100 105 110

Leu Ala Pro His Ala Arg Ser Leu Glu Phe Ser Val Arg Leu Phe Ala
115 120 125

Asn

<210> 58
<211> 1977
<212> DNA
<213> Human cytomegalovirus

<400> 58
gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60

ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120

gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 180

gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 240

aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa 300

cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360

gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 420

aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag 480

ttcagcgtgc ggctctttgc caactagcct gcgtcacggg aaataatatg ctacggcttc 540

tgcttcgtca ccactttcac tgcctgcttc tgtgcgcggt ttgggcaacg ccctgtctgg 600

cgtctccgtg gttcacgcta acggcgaacc agaatccgtc cccgccatgg tctaaactga 660

cgtatcccaa accgcatgac gcggcgacgt tttactgtcc ttttctctat ccctcgcccc 720

cacggtcccc ctcgcaattc ccggggttcc agcgggtatc aacgggtccc gagtgtcgca 780

acgagaccct gtatctgctg tacaaccggg aaggccagac cttggtggag agaagctcca 840

cctgggtgaa aaaggtgatc tggtatctga gcggtcgcaa tcagaccatc ctccaacgga 900

tgccccgaac ggcttcgaaa ccgagcgacg gaaacgtgca gatcagcgtg gaagacgcca 960

agatttttgg agcgcacatg gtgcccaagc agaccaagct gctacgtttc gtcgtcaacg 1020

atggcacacg ttatcagatg tgtgtgatga aactggagag ctgggcccac gtcttccggg 1080

actacagcgt gtcttttcag gtgcgattga cgttcaccga ggccaataac cagacttaca 1140

ccttctgcac ccatcccaat ctcatcgttt gagcccgtcg cgcgcgcagg gaattttgaa 1200

aaccgcgcgt catgagtccc aaaaacctga cgccgttctt gacggcgttg tggctgctat 1260

tgggtcacag ccgcgtgccg cgggtacgcg cagaagaatg ttgcgaattc ataaacgtca 1320

accacccgcc ggaacgctgt tacgatttca aaatgtgcaa tcgcttcacc gtcgcgtacg 1380

tattttcatg attgtctgcg ttctgtggtg cgtctggatt tgtctctcga cgtttctgat 1440

agccatgttc catcgacgat cctcgggaat gccagagtag attttcatga atccacaggc 1500

tgcggtgtcc ggacggcgaa gtctgctaca gtcccgagaa aacggctgag attcgcggga 1560

tcgtcaccac catgacccat tcattgacac gccaggtcgt acacaacaaa ctgacgagct 1620

gcaactacaa tccgtaagtc tcttcctcga gggccttaca gcctatggga aagtaagaca 1680

gagggacaaa acatcattaa aaaaaaagtc taatttcacg ttttgtaccc ccccttcccc 1740

tccgtgttgt aggttatacc tcgaagctga cgggcgaata cgctgcggca aagtgaacga 1800

caaggcgcag tacctgctgg gcgccgctgg cagcgttccc tatcgatgga tcaacctgga 1860

atacgacaag ataacccgga tcgtgggcct ggatcagtac ctggagagcg ttaagaaaca 1920

caaacggctg gatgtgtgcc gcgctaaaat gggctatatg ctgcagtgaa taataaa 1977

<210> 59
<211> 1849
<212> DNA
<213> Human cytomegalovirus

<400> 59
atgcggctgt gtcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60

cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 120

tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg 180

ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagaggtga 240

gggtacgcgc taaaggtgta tgacaacggg aaggtaaggg cgaacgggta acgggtaggt 300

aaccgcatgg ggtgtgaaat gacgttcgga acctgtgctt gcagaatcaa cgtgaccgag 360

gtgtcgttgc tcatcagcga ctttagacgt cagaaccgtc gcggcggcac caacaaaagg 420

accacgttca acgccgccgg ttcgctggcg cctcacgccc ggagcctcga gttcagcgtg 480

cggctctttg ccaactagcc tgcgtcacgg gaaataatat gctacggctt ctgcttcgtc 540

accactttca ctgcctgctt ctgtgcgcgg tttgggcaac gccctgtctg gcgtctccgt 600

ggttcacgct aacggcgaac cagaatccgt ccccgccatg gtctaaactg acgtatccca 660

aaccgcatga cgcggcgacg ttttactgtc cttttctcta tccctcgccc ccacggtccc 720

cctcgcaatt cccggggttc cagcgggtat caacgggtcc cgagtgtcgc aacgagaccc 780

tgtatctgct gtacaaccgg gaaggccaga ccttggtgga gagaagctcc acctgggtga 840

aaaaggtgat ctggtatctg agcggtcgca atcagaccat cctccaacgg atgccccgaa 900

cggcttcgaa accgagcgac ggaaacgtgc agatcagcgt ggaagacgcc aagatttttg 960

gagcgcacat ggtgcccaag cagaccaagc tgctacgttt cgtcgtcaac gatggcacac 1020

gttatcagat gtgtgtgatg aaactggaga gctgggccca cgtcttccgg gactacagcg 1080

tgtcttttca ggtgcgattg acgttcaccg aggccgataa ccagacttac accttctgca 1140

cccatcccaa tctcatcgtt tgagcccgtc gcgcgcgcag ggaattttga aaaccgcgcg 1200

tcatgagtcc caaaaacctg acgccgttct tgacggcgtt gtggctgcta ttgggtcaca 1260

gccgcgtgcc gcgggtacgc gcagaagaat gttgcgaatt cataaacgtc aaccacccgc 1320

cggaacgctg ttacgatttc aaaatgtgca atcgcttcac cgtcgcgtac gtattttcat 1380

gattgtctgc gttctgtggt gcgtctggat ctgtctctcg acgtttctga tagccatgtt 1440

ccatcgacga tcctcgggaa tgccagagta gattttcatg aatccacagg ctgcggtgtc 1500

cggacggcga agtctgctac agtcccgaga aaacggctga gattcgcggg atcgtcacca 1560

ccatgaccca ttcattgaca cgccaggtcg tacacaacaa actgacgagc tgcaactaca 1620

atccgttata cctcgaagct gacgggcgaa tacgctgcgg caaagtgaac gacaaggcgc 1680

agtacctgct gggcgccgct ggcggcgttc cctatcgatg gatcaacctg gaatacgaca 1740

agatagcccg gatcgtgggc ctggatcagt acctggagag cgttaagaaa cacaaacggc 1800

tggatgtgtg ccgcgctaaa atgggctata tgctgcagtg aataataaa 1849

<210> 60
<211> 240
<212> DNA
<213> Human cytomegalovirus

<400> 60
atgcggctgt gtcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60

cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 120

tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg 180

ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagaggtga 240

<210> 61
<211> 79
<212> PRT
<213> Human cytomegalovirus

<400> 61

Met Arg Leu Cys Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val
1 5 10 15

Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg
20 25 30

Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr
35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His
50 55 60

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg
65 70 75

<210> 62
<211> 180
<212> DNA
<213> Human cytomegalovirus

<400> 62
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcgtacgt attttcatga 180

<210> 63
<211> 59
<212> PRT
<213> Human cytomegalovirus

<400> 63

Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu
1 5 10 15

Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu
20 25 30

Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met
35 40 45

Cys Asn Arg Phe Thr Val Ala Tyr Val Phe Ser
50 55

<210> 64
<211> 515
<212> DNA
<213> Human cytomegalovirus

<400> 64
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcactgcg gtgtccggac 180

ggcgaagtct gctacagtcc cgagaaacgg ctgagattcg cgggatcgtc accaccatga 240

cccattcatt gacacgccag gtcgtacaca acaaactgac gagctgcaac tacaatctgt 300

tatacctcga agctgacggg cgaatacgct gcggcaaagt gaacgacaag gcgcagtacc 360

tgctgggcgc cgctggcagc gttccctatc gatggatcaa cctggaatac gacaagataa 420

cccggatcgt gggcctggat cagtacctgg agagcgttaa gaaacacaaa cggctggatg 480

tgtgccgcgc taaaatgggc tatatgctgc agtga 515

<210> 65
<211> 171
<212> PRT
<213> Human cytomegalovirus

<400> 65

Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu
1 5 10 15

Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu
20 25 30

Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met
35 40 45

Cys Asn Arg Phe Thr Val Ala Leu Arg Cys Pro Asp Gly Glu Val Cys
50 55 60

Tyr Ser Pro Glu Lys Thr Ala Glu Ile Arg Gly Ile Val Thr Thr Met
65 70 75 80

Thr His Ser Leu Thr Arg Gln Val Val His Asn Lys Leu Thr Ser Cys
85 90 95

Asn Tyr Asn Leu Leu Tyr Leu Glu Ala Asp Gly Arg Ile Arg Cys Gly
100 105 110

Lys Val Asn Asp Lys Ala Gln Tyr Leu Leu Gly Ala Ala Gly Ser Val
115 120 125

Pro Tyr Arg Trp Ile Asn Leu Glu Tyr Asp Lys Ile Thr Arg Ile Val
130 135 140

Gly Leu Asp Gln Tyr Leu Glu Ser Val Lys Lys His Lys Arg Leu Asp
145 150 155 160

Val Cys Arg Ala Lys Met Gly Tyr Met Leu Gln
165 170

<210> 66
<211> 804
<212> DNA
<213> Human cytomegalovirus

<400> 66
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcgtacgt attttcatga 180

ttgtctgcgt tctgtggtgc gtctggatct gtctctcgac gtttctgata gccatgttcc 240

atcgacgatc ctcgggaatg ccagagtaga ttttcatgaa tccacaggct gcggtgtccg 300

gacggcgaag tctgctacag tcccgagaaa acggctgaga ttcgcgggat cgtcaccacc 360

atgacccatt cattgacacg ccaggtcgta cacaacaaac tgacgagctg caactacaat 420

ccgtaagtct cttcctcgag ggccttacag cctatgggaa agtaagacag agggacaaaa 480

catcattaaa aaaaaagtct aatttcacgt tttgtacccc cccttccccc ccgtgttgta 540

ggttatacct cgaagctgac gggcgaatac gctgcggcaa agtgaacgac aaggcgcagt 600

acctgctggg cgccgctggc ggcgttccct atcgatggat caacctggaa tacgacaaga 660

tagcccggat cgtgggcctg gatcagtacc tggagagcgt taagaaacac aaacggctgg 720

atgtgtgccg cgctaaaatg ggctatatgc tgcagtgaat aataaaatgt gtgtttgtcc 780

gaaatacgcg ttttgagatt tctg 804

<210> 67
<211> 685
<212> DNA
<213> Human cytomegalovirus

<400> 67
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcgtacgt attttcatga 180

ttgtctgcgt tctgtggtgc gtctggatct gtctctcgac gtttctgata gccatgttcc 240

atcgacgatc ctcgggaatg ccagagtaga ttttcatgaa tccacaggct gcggtgtccg 300

gacggcgaag tctgctacag tcccgagaaa acggctgaga ttcgcgggat cgtcaccacc 360

atgacccatt cattgacacg ccaggtcgta cacaacaaac tgacgagctg caactacaat 420

ccgttatacc tcgaagctga cgggcgaata cgctgcggca aagtgaacga caaggcgcag 480

tacctgctgg gcgccgctgg cggcgttccc tatcgatgga tcaacctgga atacgacaag 540

atagcccgga tcgtgggcct ggatcagtac ctggagagcg ttaagaaaca caaacggctg 600

gatgtgtgcc gcgctaaaat gggctatatg ctgcagtgaa taataaaatg tgtgtttgtc 660

caaaaaaaaa aaaaaaaaaa aaaaa 685

<210> 68
<211> 180
<212> DNA
<213> Human cytomegalovirus

<400> 68
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcgtacgt attttcatga 180

<210> 69
<211> 59
<212> PRT
<213> Human cytomegalovirus

<400> 69

Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu
1 5 10 15

Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu
20 25 30

Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met
35 40 45

Cys Asn Arg Phe Thr Val Ala Tyr Val Phe Ser
50 55

<210> 70
<211> 780
<212> DNA
<213> Human cytomegalovirus

<400> 70
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcgtacgt atttttatga 180

ttgtctgcgt tctgtggtgc gtctggattt gtctctcgac gtttctgata gccatgttcc 240

atcgacgatc ctcgggaatg ccagagtaga ttttcatgaa tccacaggct gcggtgtccg 300

gacggcgaag tctgctacag tcccgagaaa acggctgaga ttcgcgggat cgtcaccacc 360

atgacccatt cattgacacg ccaggtcgta cacaacaaac tgacgagctg caactacaat 420

ccgtaagtct cttcctcgag ggccttacag cctatgggaa agtaagacag agggacaaaa 480

catcattaaa aaaaaagtct aatttcacgt tttgtacccc cccttccccc ccgtgttgta 540

ggttatacct cgaagctgac gggcgaatac gctgcggcaa agtgaacgac aaggcgcagt 600

acctgctggg cgccgctggc agcgttccct atcgatggat caacctggaa tacgacaaga 660

taacccggat cgtgggcctg gatcagtacc tggagagcgt taagaaacac aaacggctgg 720

atgtgtgccg cgctaaaatg ggctatatgc tgcagtgaat aataaaatgt gtgtttgtcc 780

<210> 71
<211> 529
<212> DNA
<213> Human cytomegalovirus

<400> 71
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcgctgcg gtgtccggac 180

ggcgaagtct gctacagtcc cgagaaaacg gctgagattc gcgggatcgt caccaccatg 240

acccattcat tgacacgcca ggtcgtacac aacaaactga cgagctgcaa ctacaatccg 300

ttatacctcg aagctgacgg gcgaatacgc tgcggcaaag tgaacgacaa ggcgcagtac 360

ctgctgggcg ccgctggcag cgttccctat cgatggatca acctggaata cgacaagata 420

acccggatcg tgggcctgga tcagtacctg gagagcgtta agaaacacaa acggctggat 480

gtgtgccgcg ctaaaatggg ctatatgctg cagtgaataa taaaatgtg 529

<210> 72
<211> 515
<212> DNA
<213> Human cytomegalovirus

<400> 72
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcactgcg gtgtccggac 180

ggcgaagtct gctacagtcc cgagaaacgg ctgagattcg cgggatcgtc accaccatga 240

cccattcatt gacacgccag gtcgtacaca acaaactgac gagctgcaac tacaatctgt 300

tatacctcga agctgacggg cgaatacgct gcggcaaagt gaacgacaag gcgcagtacc 360

tgctgggcgc cgctggcagc gttccctatc gatggatcaa cctggaatac gacaagataa 420

cccggatcgt gggcctggat cagtacctgg agagcgttaa gaaacacaaa cggctggatg 480

tgtgccgcgc taaaatgggc tatatgctgc agtga 515

<210> 73
<211> 171
<212> PRT
<213> Human cytomegalovirus

<400> 73

Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu
1 5 10 15

Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu
20 25 30

Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met
35 40 45

Cys Asn Arg Phe Thr Val Ala Leu Arg Cys Pro Asp Gly Glu Val Cys
50 55 60

Tyr Ser Pro Glu Lys Thr Ala Glu Ile Arg Gly Ile Val Thr Thr Met
65 70 75 80

Thr His Ser Leu Thr Arg Gln Val Val His Asn Lys Leu Thr Ser Cys
85 90 95

Asn Tyr Asn Leu Leu Tyr Leu Glu Ala Asp Gly Arg Ile Arg Cys Gly
100 105 110

Lys Val Asn Asp Lys Ala Gln Tyr Leu Leu Gly Ala Ala Gly Ser Val
115 120 125

Pro Tyr Arg Trp Ile Asn Leu Glu Tyr Asp Lys Ile Thr Arg Ile Val
130 135 140

Gly Leu Asp Gln Tyr Leu Glu Ser Val Lys Lys His Lys Arg Leu Asp
145 150 155 160

Val Cys Arg Ala Lys Met Gly Tyr Met Leu Gln
165 170

<210> 74
<211> 1977
<212> DNA
<213> Human cytomegalovirus

<400> 74
gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60

ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120

gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 180

gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 240

aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa 300

cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360

gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 420

aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag 480

ttcagcgtgc ggctctttgc caactagcct gcgtcacggg aaataatatg ctacggcttc 540

tgcttcgtca ccactttcac tgcctgcttc tgtgcgcggt ttgggcaacg ccctgtctgg 600

cgtctccgtg gttcacgcta acggcgaacc agaatccgtc cccgccatgg tctaaactga 660

cgtatcccaa accgcatgac gcggcgacgt tttactgtcc ttttctctat ccctcgcccc 720

cacggtcccc ctcgcaattc ccggggttcc agcgggtatc aacgggtccc gagtgtcgca 780

acgagaccct gtatctgctg tacaaccggg aaggccagac cttggtggag agaagctcca 840

cctgggtgaa aaaggtgatc tggtatctga gcggtcgcaa tcagaccatc ctccaacgga 900

tgccccgaac ggcttcgaaa ccgagcgacg gaaacgtgca gatcagcgtg gaagacgcca 960

agatttttgg agcgcacatg gtgcccaagc agaccaagct gctacgtttc gtcgtcaacg 1020

atggcacacg ttatcagatg tgtgtgatga aactggagag ctgggcccac gtcttccggg 1080

actacagcgt gtcttttcag gtgcgattga cgttcaccga ggccaataac cagacttaca 1140

ccttctgcac ccatcccaat ctcatcgttt gagcccgtcg cgcgcgcagg gaattttgaa 1200

aaccgcgcgt catgagtccc aaaaacctga cgccgttctt gacggcgttg tggctgctat 1260

tgggtcacag ccgcgtgccg cgggtacgcg cagaagaatg ttgcgaattc ataaacgtca 1320

accacccgcc ggaacgctgt tacgatttca aaatgtgcaa tcgcttcacc gtcgcgtacg 1380

tattttcatg attgtctgcg ttctgtggtg cgtctggatt tgtctctcga cgtttctgat 1440

agccatgttc catcgacgat cctcgggaat gccagagtag attttcatga atccacaggc 1500

tgcggtgtcc ggacggcgaa gtctgctaca gtcccgagaa aacggctgag attcgcggga 1560

tcgtcaccac catgacccat tcattgacac gccaggtcgt acacaacaaa ctgacgagct 1620

gcaactacaa tccgtaagtc tcttcctcga gggccttaca gcctatggga aagtaagaca 1680

gagggacaaa acatcattaa aaaaaaagtc taatttcacg ttttgtaccc ccccttcccc 1740

tccgtgttgt aggttatacc tcgaagctga cgggcgaata cgctgcggca aagtgaacga 1800

caaggcgcag tacctgctgg gcgccgctgg cagcgttccc tatcgatgga tcaacctgga 1860

atacgacaag ataacccgga tcgtgggcct ggatcagtac ctggagagcg ttaagaaaca 1920

caaacggctg gatgtgtgcc gcgctaaaat gggctatatg ctgcagtgaa taataaa 1977

<210> 75
<211> 1620
<212> DNA
<213> Human cytomegalovirus

<400> 75
atgcggctgt gtcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60

cagcgggaga ccgcagaaaa aaaaacgatt attaccgagt accgcattac tgggacgcgt 120

gctctcgcgc gctgcctgac caaacccgtt acaagtatgt ggaacagctc gtggacctca 180

cgttgaacta ccactacgat gcgagccacg gcttggacaa ctttgacgtg ctcaagagaa 240

tcaacgtgac cgaggtgtcg ttgctcatca gcgactttag acgtcagaac cgtcgcggcg 300

gcaccaacaa aaggaccacg ttcaacgccg ccggttcgct ggcgcctcac gcccggagcc 360

tcgagttcag cgtgcggctc tttgccaact agcctgcgtc acgggaaata atatgctacg 420

gcttctgctt cgtcaccact ttcactgcct gcttctgtgc gcggtttggg caacgccctg 480

tctggcgtct ccgtggttca cgctaacggc gaaccagaat ccgtccccgc catggtctaa 540

actgacgtat cccaaaccgc atgacgcggc gacgttttac tgtccttttc tctatccctc 600

gcccccacgg tccccctcgc aattcccggg gttccagcgg gtattaacgg gtcccgagtg 660

tcgcaacgag accctgtatc tgctgtacaa ccgggaaggc cagaccttgg tggagagaag 720

ctccacctgg gtgaaaaagg tgatctggca tctgagcggt cgcaatcaga ccatcctcca 780

acggatgccc cgaacggctt cgaaaccgag cgacggaaac gtgcagatca gcgtggaaga 840

cgccaagatt tttggagcgc acatggtgcc caagcagacc aagctgctac gtttcgtcgc 900

caacgatggc acacgttatt agatgtgtgt gatgaaactg gagagctggg cccacgtctt 960

ccgggactac agcgtgtctt ttcaggtgcg attgacgttc accgaggcca ataaccagac 1020

ttacaccttc tgcacccatc ccaatctcat cgtttgagcc cgtcgcgcgc gcagggaatt 1080

ttgaaaaccg cgcgtcatga gtcccaaaaa cctgacgccg ttcttgacgg cgttgtggct 1140

gctattgggt cacagccgcg tgccgcgggt acgcgcagaa gaatgttgcg aattcataaa 1200

cgtcaaccac ccgccggaac gctgttacga tttcaaaatg tgcaatcgct tcaccgtcgc 1260

actgcggtgt ccggacggcg aagtctgcta cagtcccgag aaaacggctg agattcgcgg 1320

gatcgtcacc accatgaccc attcattgac acgccaggtc gtacacaaca aactgacgag 1380

ctgcaactac aatctgttat acctcgaagc tgacgggcga atacgctgcg gcaaagtgaa 1440

cgacaaggcg cagtacctgc tgggcgccgc tggcagcgtt ccctatcgat ggatcaacct 1500

ggaatacgac aagataaccc ggatcgtggg cctggatcag tacctggaga gcgttaagaa 1560

atacaaacgg ctggatgtgt gccgcgctaa aatgggctat atgctgcagt gaataataaa 1620

<210> 76
<211> 645
<212> DNA

<213> Human cytomegalovirus

<400> 76
atgctacggc ttctgcttcg tcaccacttt cactgcctgc ttctgtgcgc ggtttgggca 60

acgccctgtc tggcgtctcc gtggttcacg ctaacggcga accagaatcc gtccccgcca 120

tggtctaaac tgacgtatcc caaaccgcat gacgcggcga cgttttactg tccttttctc 180

tatccctcgc ccccacggtc cccctcgcaa ttcccggggt tccagcgggt atcaacgggt 240

cccgagtgtc gcaacgagac cctgtatctg ctgtacaacc gggaaggcca gaccttggtg 300

gagagaagct ccacctgggt gaaaaaggtg atctggtatc tgagcggtcg caatcagacc 360

atcctccaac ggatgccccg aacggcttcg aaaccgagcg acggaaacgt gcagatcagc 420

gtggaagacg ccaagatttt tggagcgcac atggtgccca agcagaccaa gctgctacgt 480

ttcgtcgtca acgatggcac acgttatcag atgtgtgtga tgaaactgga gagctgggcc 540

cacgtcttcc gggactacag cgtgtctttt caggtgcgat tgacgttcac cgaggccaat 600

aaccagactt acaccttctg cacccatccc aatctcatcg tttga 645

<210> 77
<211> 214
<212> PRT
<213> Human cytomegalovirus

<400> 77

Met Leu Arg Leu Leu Leu Arg His His Phe His Cys Leu Leu Leu Cys
1 5 10 15

Ala Val Trp Ala Thr Pro Cys Leu Ala Ser Pro Trp Phe Thr Leu Thr
20 25 30

Ala Asn Gln Asn Pro Ser Pro Pro Trp Ser Lys Leu Thr Tyr Pro Lys
35 40 45

Pro His Asp Ala Ala Thr Phe Tyr Cys Pro Phe Leu Tyr Pro Ser Pro
50 55 60

Pro Arg Ser Pro Ser Gln Phe Pro Gly Phe Gln Arg Val Ser Thr Gly
65 70 75 80

Pro Glu Cys Arg Asn Glu Thr Leu Tyr Leu Leu Tyr Asn Arg Glu Gly
85 90 95

```
Gln Thr Leu Val Glu Arg Ser Ser Thr Trp Val Lys Lys Val Ile Trp
            100                 105                 110

Tyr Leu Ser Gly Arg Asn Gln Thr Ile Leu Gln Arg Met Pro Arg Thr
        115                 120                 125

Ala Ser Lys Pro Ser Asp Gly Asn Val Gln Ile Ser Val Glu Asp Ala
    130                 135                 140

Lys Ile Phe Gly Ala His Met Val Pro Lys Gln Thr Lys Leu Leu Arg
145                 150                 155                 160

Phe Val Val Asn Asp Gly Thr Arg Tyr Gln Met Cys Val Met Lys Leu
                165                 170                 175

Glu Ser Trp Ala His Val Phe Arg Asp Tyr Ser Val Ser Phe Gln Val
            180                 185                 190

Arg Leu Thr Phe Thr Glu Ala Asn Asn Gln Thr Tyr Thr Phe Cys Thr
        195                 200                 205

His Pro Asn Leu Ile Val
    210
```

<210> 78
<211> 214
<212> PRT
<213> Human cytomegalovirus

<400> 78

```
Met Leu Arg Leu Leu Leu Arg His His Phe His Cys Leu Leu Leu Cys
1               5                   10                  15

Ala Val Trp Ala Thr Pro Cys Leu Ala Ser Pro Trp Phe Thr Leu Thr
            20                  25                  30

Ala Asn Gln Asn Pro Ser Pro Pro Trp Ser Lys Leu Thr Tyr Pro Lys
        35                  40                  45

Pro His Asp Ala Ala Thr Phe Tyr Cys Pro Phe Leu Tyr Pro Ser Pro
    50                  55                  60
```

```
Pro Arg Ser Pro Ser Gln Phe Pro Gly Phe Gln Arg Val Ser Thr Gly
65                  70                  75                  80

Pro Glu Cys Arg Asn Glu Thr Leu Tyr Leu Leu Tyr Asn Arg Glu Gly
                85                  90                  95

Gln Thr Leu Val Glu Arg Ser Ser Thr Trp Val Lys Lys Val Ile Trp
            100                 105                 110

Tyr Leu Ser Gly Arg Asn Gln Thr Ile Leu Gln Arg Met Pro Arg Thr
        115                 120                 125

Ala Ser Lys Pro Ser Asp Gly Asn Val Gln Ile Ser Val Glu Asp Ala
    130                 135                 140

Lys Ile Phe Gly Ala His Met Val Pro Lys Gln Thr Lys Leu Leu Arg
145                 150                 155                 160

Phe Val Val Asn Asp Gly Thr Arg Tyr Gln Met Cys Val Met Lys Leu
                165                 170                 175

Glu Ser Trp Ala His Val Phe Arg Asp Tyr Ser Val Ser Phe Gln Val
            180                 185                 190

Arg Leu Thr Phe Thr Glu Ala Asn Asn Gln Thr Tyr Thr Phe Cys Thr
        195                 200                 205

His Pro Asn Leu Ile Val
    210
```

<210> 79
<211> 171
<212> PRT
<213> Human cytomegalovirus

<400> 79

```
Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu
1               5                   10                  15

Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu
            20                  25                  30
```

```
Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met
        35                  40                  45

Cys Asn Arg Phe Thr Val Ala Leu Arg Cys Pro Asp Gly Glu Val Cys
    50                  55                  60

Tyr Ser Pro Glu Lys Thr Ala Glu Ile Arg Gly Ile Val Thr Thr Met
65                  70                  75                  80

Thr His Ser Leu Thr Arg Gln Val Val His Asn Lys Leu Thr Ser Cys
                85                  90                  95

Asn Tyr Asn Pro Leu Tyr Leu Glu Ala Asp Gly Arg Ile Arg Cys Gly
            100                 105                 110

Lys Val Asn Asp Lys Ala Gln Tyr Leu Leu Gly Ala Ala Gly Ser Val
        115                 120                 125

Pro Tyr Arg Trp Ile Asn Leu Glu Tyr Asp Lys Ile Thr Arg Ile Val
    130                 135                 140

Gly Leu Asp Gln Tyr Leu Glu Ser Val Lys Lys His Lys Arg Leu Asp
145                 150                 155                 160

Val Cys Arg Ala Lys Met Gly Tyr Met Leu Gln
                165                 170
```